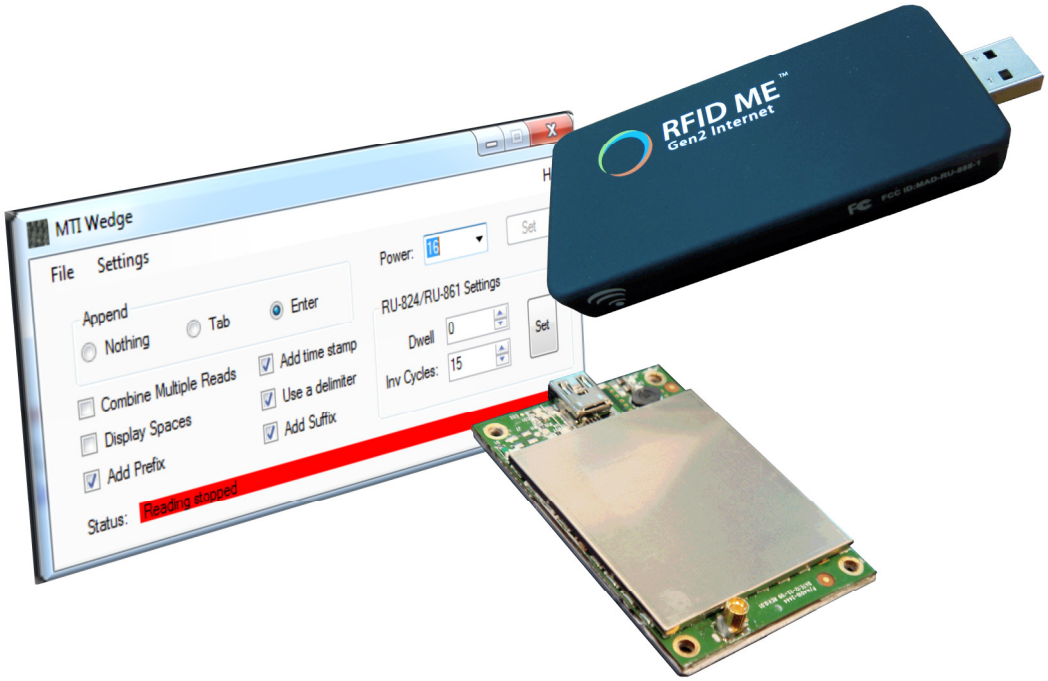
RFID Wedge Software

For the MTI RFID ME™ family of
RFID readers



User's Manual

Version 2.1

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BAIT Consulting

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Version Control

Version	Date	Notes
1.0	Oct 2011	Initial release
2.0	Jan 2012	Updated USB HID interface, resolved conflict issues that occured with some USB devices
2.1	Apr 2012	RU-824 functionality has been added.
2.1.7	Apr 2012	Adjusted read functionality to address heat issue.

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Introduction

The goal of the RFID Wedge is to provide a true plug and play experience for the MTI RFID ME™ and RU-824/861 RFID reader sets. While the readers are USB HID compliant devices they are, by their very nature, not the same as other devices such as keyboards and bar code scanners. The RFID readers need to have various settings controlled, and more importantly, they need to be told to start and stop the reading process. The RFID Wedge is designed to do just that – to provide the user with a transparent experience where they can both "just use the reader" and still be able to configure it as needed.

The RFID Wedge software has been designed to act as an invisible interface between the RFID reader and your computer. During normal day to day use, the software will sit in the Windows system tray (see below) ready for use. When RFID tags need to be read, you can just plug the reader in, wait for the notification icon in the tool tray to turn green and then place the tag within range of the reader.

When the RFID reading is completed, the reader can be unplugged and the software will just wait for the next time that the reader is plugged in. There a number of settings available that will allow the RFID reader to act like many of the bar code scanners currently on the market – allowing companies to replace their bar code scanner solutions with RFID without the need to redesign or reprogram their existing applications and business processes.

This manual assumes a basic knowledge of RFID and computers. If there are any questions, please feel free to contact us at autoid@ohio.edu.

Using the RFID ME™

The RFID ME™ USB Dongle and RU-824/861 RFID readers are unlike most other RFID readers in that they are USB HID devices. Additionally, since it is a small and compact reader, there are limitations to its read range and the directions in which it will optimally work. As is shown below for the USB Dongle, the edge identified is the optimal edge for reading tags. Tags placed on the top or left edge (as seen below) of the reader will result in decreased read ranges. If the tags are in those locations and no reads are seen, there is nothing wrong with the reader, the configuration or the software – just move the tag towards the indicated edge and the reader should see the tags.

The other consideration that needs to be understood is that the RFID tags need to be oriented (approximately) in the same manner as the RFID ME™. So, if the tag as a long side, it needs to be held such that it is parallel to the long edge of the RFID ME™ to help ensure an optimal reading orientation.

The RFID Wedge software

The RIFD Wedge will install itself into the Startup folder on the computer. This will allow the software to startup when the computer is started and the user logs in, allowing it to always be ready for use. The user can plug the RFID reader in as needed and then unplug it when it is not needed, without having to remember to open and close additional software. The software will take any read RFID tags and place them in the keyboard buffer of the computer – basically allowing the RFID reader to act just like a second keyboard. This is the same type of functionality that is seen in most of the bar code scanners on the market today. It should be noted that, due to this intended functionality if two readers are connected simultaneously when a tag is read, the results will be inconsistent just as if two keyboards were plugged in and someone were to try typing on both at the same time.

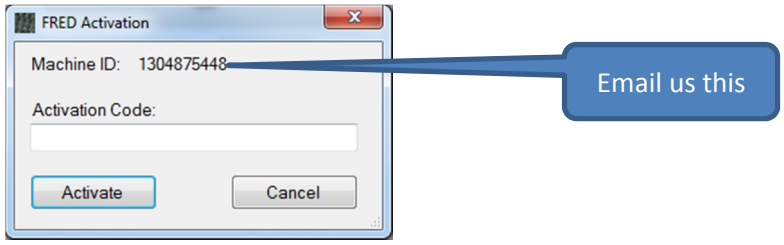
Installation

To install the software, download a copy from. Follow the installation instructions.

The installer will automatically place the RFID Wedge software in the "Startup" folder of the Windows Start Menu. This will allow the software to automatically load every time someone logs onto the computer. If you do not want this to occur, and want to manually start the software, delete the shortcut. The installer will also place a copy of the shortcut in the "RFID ME Software" folder of the Windows Start Menu.

Activation

The RFID Wedge software is freely distributed in "demo mode", which will randomly replace various characters in the RFID tag data. To use this in a fully functional mode, you will need to activate it. To do so, select "Help→Activate". Email us at kevin@bait-consulting.com with the "machine id" value. We will send you back the "activation code".



Using the RFID Wedge

Using the RFID Wedge is simple. Make sure the RFID Wedge has been started and that it is in the Windows System Tray. Plug in the RFID reader. The icon (see below) will be green if the RFID reader has been plugged in. If the reader needs to be plugged in, the icon will be red.

At this point, you are ready to start reading tags. Open up Notepad (or any other software that you want to use) and hold an RFID tag near the RFID reader. That's it! The tag value will have displayed in your software and the "Enter" key will have been pressed for you (the default settings).

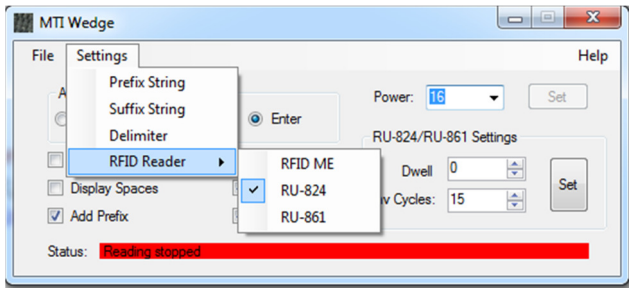
When you are done reading tags, you can just unplug the reader (or leave it in – please note that it will get a little warm). If, for any reason, you want to quit the RFID Wedge software, you can right click on the icon and select “Exit” and click “Yes”.

Configuration

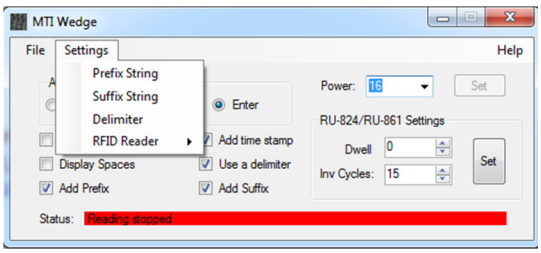
The RFID Wedge has a number of configuration settings available to it. These settings have been provided to allow the user to control not only the reader, but how the data is reported back to the computer. This has been done to allow the RFID reader to act as seamlessly as possible, should it be used to replace a traditional bar code scanner wedge. The settings that can be changed are:

- Prefix and suffix usage and values
- Appending keystrokes at the end of the data stream
- Addition of a timestamp
- Control the reader’s power level
- Control how the reader reports tags

To get to the configuration settings, double click **or** right click on the RFID Wedge icon and select “Settings”. All settings are automatically saved, so once the software is set the way you like it, you will not have to change things again.



Tag Data Formatting



The tag data can be formatted in a number of ways.

- Prefix and suffix data can be included, should business processes require it.
- Time/date stamps can be included and the delimiter between the time/date stamp and the tag data can be controlled.
- A keystroke can be appended to the end of the data stream (tag, enter, nothing).

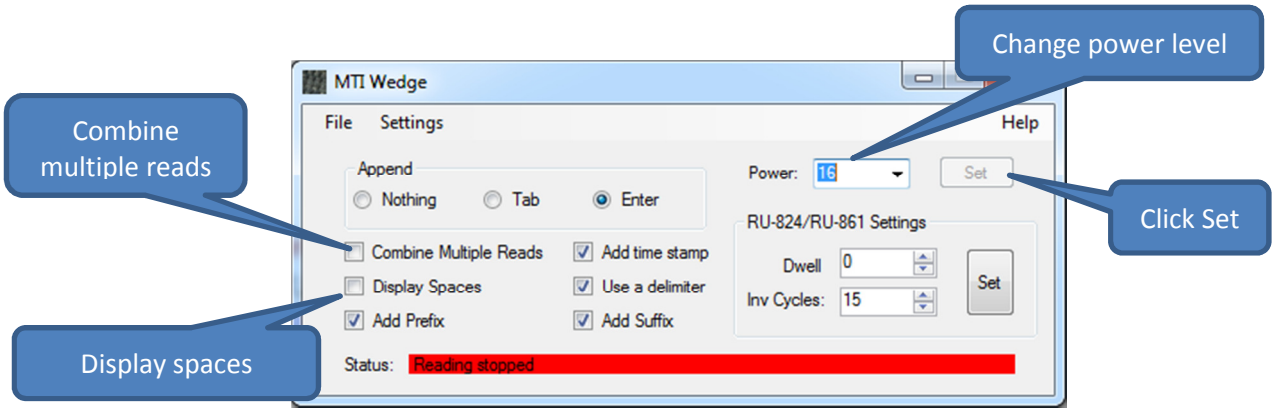
Under the "Settings" menu item, any prefix or suffix characters can be defined. If a previously configured value exists, it will be displayed. By setting the prefix/suffix string and then checking the "Add Prefix" or "Add Suffix" checkbox, the use of any prefixes or suffixes will be added to the tag data.

If time/date stamps are required for an application the "Add time stamp" check box can be checked. Use "Settings→Delimiter" to define how the tag data (including any prefix/suffix strings) will be separated from the time/date value. The "Use a delimiter" check box needs to be selected. If a delimiter string is not used or the "use a delimiter" check box is not selected, the tag data and the time/date string will run together.

The "Append" group in the middle of the screen refers to the keystroke (if any) that is appended to the end of the data. These keystrokes will alleviate the user from having to scan a tag and then press the key. The "Enter" or "Return" key is the default, but either the "Tab" key or "Nothing" can be selected. Since only one of these can be practically done at a time (normally after entering a value someone does not press **BOTH** the enter key and the tab key), the software has been set to only allow one of these.

Reader Controls

There are a few reader controls that are included with the RFID Wedge. The "Power" drop down list will allow you to set the power level of the reader. This value should be set to the minimum required level so as to ensure that tags that are "close enough" to the reader are not being accidently read.



To change the power level, select the desired power level and click on "Set". It should be noted that this can only be done when the RFID reader is plugged in.

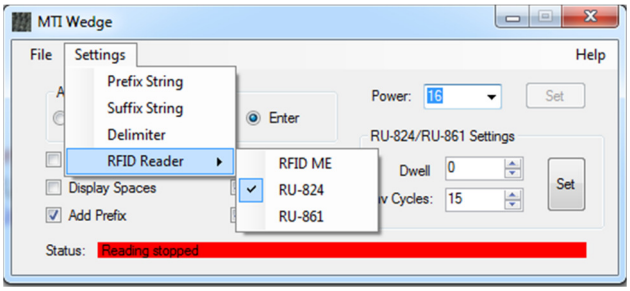
The "Combine Multiple Reads" check box forces the RFID Wedge to combine consecutive reads into a single reported read event. Since the reader will read a single tag multiple times per second, this

function is needed to ensure that a given tag is only read one. If this is selected, the tag must be removed from the read range for approximately one second before it is read again. To report every read, deselect this.

For the RU-824 and the RU-861, some inventory specific controls have also been implemented. Specifically, the user can adjust the dwell time and the number of inventory cycles performed each time the reader is polled. It is suggested that the Dwell be left at zero (0) and the Inv Cycles be left at 15. It should be noted that the lower these values, the faster the reader will respond. Conversely, if there instances where tags are not being picked up as anticipated, and increasing the power does not help, then a slight increase in the Inv Cycles value may help. Remember, as the Inv Cycles value is increased, the longer it will take for the reader to complete an inventory command, and the slower the reader will seem to respond.

The MTI demo software displays the RFID tags such that every two characters are separated by a single space. Selecting the "Display Spaces" check box will mimic this functionality should it be desired.

Under "Settings→RFID Reader", the RFID readers that are supported can be selected.



Finally, should there be a need to manually stop the reader, the user can right click on the icon in the Windows System Tray and click on "Stop Reading". This will stop the reading cycle. To restart reading, go to the Settings screen and then minimize it.

The software has been designed such that if the configuration/settings screen is open, the reader will not attempt to read any tags (this is to prevent incoming tag data from accidently being pushed into the configuration screen). Whenever the screen is minimized/returned to the System Tray, reading will be automatically restarted if there is a connected reader.

Trouble shooting

Issue	Possible solutions
RFID Tags are not being read	• Ensure that the RFID reader is plugged in and that the icon in the tool tray is green • Ensure that the power is turned up sufficiently to allow for reading of the tags • Ensure that the configuration/Settings window is closed (remember, when it is open, reading is disabled). • For the RU-824, make sure the reader is not sitting directly on a metal surface. • For all readers, check to see if they have become hot to the touch. Especially for the RU-824, if the reader gets too hot, internal logic within the reader will turn off the radio to protect the reader. Once it has cooled down, it should begin reading again.
RFID reader is not being found	• Make sure you have selected the correct model of reader from the Settings→RFID Reader sub-menu • If using an RU-824, make sure you are using the cable with the double USB plug on one end and that **BOTH** plugs have been plugged into active USB ports. If only one plug is plugged in, the reader may not be recognized.
Wedge software is responding too slowly to tags	• If you are using the RU-824, try lowering the Inv Cycles value. By default, we have set the software to a value of 15. If you want a faster response time (ie. you are logging how often a tag is being seen), you can reduce this number all the way down to 1. However, there may be other, adverse results of using too small of a value. Additionally, the unit was not designed for prolonged continuous reading (multiple hours). If the reader is forced to do so continuously for hours on end, it will overheat. To help prevent that, the RFID Wedge software currently pauses for about 250ms after each read attempt. This was done to a) allow the software to run indefinitely and b) to prevent the reader from wanting to power down the radio due to the temperature. If you have an application where you need continuous (more than an hour) reading at a faster poll rate, please contact us and we will work with you to develop a version that will meet your needs.